Exhibit 6

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION

SPACETIME3D, INC., **Plaintiff,** **v.** **APPLE INC.,** **Defendant.**	**Case No. 6:22-cv-00149** **JURY TRIAL DEMANDED**

<u>Declaration of Dr. Scott Schaefer in Support of SpaceTime's Responsive Claim Construction Brief</u>

I. Introduction

1. I have been asked by counsel for SpaceTime3D, Inc., ("SpaceTime") to provide opinions concerning the construction of a single claim term in U.S. Patent No. 8,881,048 (the "'048 Patent") in response to the declaration of Dr. Andrew Wolfe.

2. If I am called to testify as an expert witness, I expect to give testimony concerning my qualifications and experience, the technical subject matter of the '048 Patent, the level of a person having ordinary skill in the art, and the proper construction of the disputed claim term "texturing" from claims 1 and 8 and their dependent claims in the '048 Patent.

3. I am being compensated for my work on this matter at my current consulting rate of $550 per hour. I am separately reimbursed for expenses. As an independent consultant, I am being compensated solely for my time spent, and my compensation is not contingent on the content of my opinions or the outcome of this action or the construction of the claims.

II. Qualifications and Experience

4. I received a B.S. in Computer Science and Mathematics in 2000 from Trinity University. Afterwards, I attended Rice University and received an M.S. in Computer Science in 2003 and a Ph.D. in Computer Science in 2006. After graduating from Rice University, I began a faculty position at Texas A&M University in 2006 as an Assistant Professor. I was promoted to Associate Professor in 2012 and to Full Professor in 2016. I served as the person in charge of accreditation for our Computer Science degree from 2013-2017. I became Associate Department Head of the Department of Computer Science & Engineering in 2017 and I was appointed Department Head in 2019, a role in which I have served since. In 2019 I was awarded the Eppright Professorship in Engineering and was named the holder of the Lynn '83 and Bill Crane '84 Department Head Chair in 2020.

5. I have been awarded multiple awards for my teaching and research activities. I was named a member of the 2008 DARPA Computer Science Study Panel. I was awarded the Gunter Enderle Award in 2011 for my research. In 2012, I received an NSF CAREER Award for my research work. My research was subsequently recognized in 2015 when I was named the Herbert H. Richardson Faculty Fellow by the College of Engineering. I was also awarded the 2019 TEES Research Impact Award to recognize significant contributions and impact in the area of research. In addition to these awards, I have received multiple best paper awards for my research in the past.

6. I have received multiple teaching awards from the Computer Science & Engineering department for teaching excellence over the years. In 2017 I was awarded the Distinguished Achievement Award in Teaching at the College level. In 2019 I was awarded the

Distinguished Achievement Award for Teaching at the University level, one of the highest university honors that is awarded.

7. In addition to my academic experience, I have worked for a number of companies in different capacities. Before becoming involved in academia, I was employed by Southwest Research Institute to work on radio direction finding algorithms for the U.S. Navy in 1999-2000. I worked at WholeBrain Media on early mobile development from 1997-1999 including network communications. At Rare Medium, I performed what is now called full stack development and developed e-commerce platforms for various companies in 2000. I spent time at SensAble Technologies in 2003 developing implicit modeling algorithms for their haptic feedback system. In 2004, I was also employed by a startup company called Mok3 that was developed out of MIT to work on core computer vision algorithms for their image-based modeling software. This product constructed 3D models from sets of photographs of objects. I wrote the code that computed correspondences between images and ran a nonlinear optimization to align the images in 3D so that a virtual model of the object could be reconstructed. I was also employed by Microsoft Research as an intern in 2005 and subsequently as a visiting researcher in 2006 where we worked on a number of surface modeling methods in computer graphics. My work at Microsoft Research motivated the inclusion of what is now called the tessellator unit in DirectX 11, which is an application programming interface ("API") that governs the relationship between multimedia hardware. Every graphics card produced since 2009 has been influenced by my work there.

8. My research specialization lies in the field of computer graphics. My research has spanned a number of areas in computer graphics. For example, I have researched and published extensively on topics from sampling methods used for rendering to how to represent surfaces and volumes in computer-generated images. I have developed some of the most popular methods in

the world for extracting surfaces from implicit data. My work in barycentric coordinates has been foundational and helped establish it as a field of research. In addition, my somewhat recent work in bijective parameterization, very much related to the aspect of texturing, has created a new area of research in computer graphics providing a solution to a long-standing problem in surface parameterization. My research has been implemented by a number of companies including Microsoft, Pixar, Adobe, and Nvidia. In addition, my work on architectural optimization to create surfaces out of small numbers of discrete panels was used to design and construct a ski lift in Switzerland.

9. In addition, I have served as an Associate or Guest Editor for a number of computer graphics research journals including Graphical Models, The Visual Computer, Computer Aided Design, Computer Aided Geometric Design, Transactions on Visualization and Computer Graphics, Computer Graphics and Applications, and ACM Transactions on Graphics. In addition to this service I have served as papers chair for most major computer graphics conferences and have served on the program committees of all major graphics conferences. I also serve on the steering committee of the Geometric Modeling and Processing conference.

10. In terms of instruction, I teach and have developed courses on a variety of topics in Computer Science. I have taught courses in computer graphics, geometric modeling, game development, data structures and algorithms, as well as both our lower level and upper level undergraduate seminar courses.

III. Materials Considered

11. I considered the following materials in evaluating the disputed claim term and preparing this declaration:

- The ’048 Patent and its prosecution history;

- The parties' proposed constructions;
- Apple's opening claim construction brief;
- The declaration of Dr. Andrew Wolfe submitted in this case.

IV. Legal Standards

12. I understand that the words of a claim are generally given their ordinary and customary meaning. I understand the ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention. I understand the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification.

13. I understand claim construction focuses on the intrinsic evidence, which consists of the claims themselves, the specification, and the prosecution history. I understand the claims can provide helpful context for how the claim term is used. I understand the specification is highly relevant to the claim construction analysis and usually dispositive concerning the meaning of a claim term. I also understand, however, that the particular examples or embodiments discussed in the specification are not to be read into the claims as limitations. I understand that the prosecution history can provide information about how the United States Patent & Trademark Office ("USPTO") patent examiner and the patent applicant understood the claim language.

14. I understand that extrinsic evidence may also be considered when determining the meaning of a claim. I understand there are different sources of extrinsic evidence, including dictionaries, inventor testimony, expert testimony, and learned treatises. I understand that intrinsic evidence is generally favored over extrinsic evidence, and that extrinsic evidence may not be used to contradict the meaning of the claim when read in light of the intrinsic evidence. I understand

that claims are generally given their meaning as understood by a person of ordinary skill in the art when read in the context of the specification and prosecution history, subject to situations of lexicography or disavowal. I understand that to act as its own lexicographer, a patentee must clearly set forth a definition of the claim term that is different from its plain and ordinary meaning, and clearly express an intent to redefine the term. I understand that disavowal requires a clear and unmistakable disclaimer of claim scope, such as the specification or prosecution history making clear that the invention does not include a particular feature, or that it is limited to a particular embodiment of the invention.

15. The ’048 Patent was filed on March 31, 2010 as a continuation of application No. 11/531,676, filed on Sep. 13, 2006, now Pat. No. 7,735,018. It claims priority to a provisional application filed September 13, 2005. I have assumed, for the purposes of this declaration, that the priority date of the claims asserted in this matter is September 13, 2005. However, if the September 13, 2006 date is the correct priority date, my opinions in this declaration would not change.

16. In my opinion, a person of ordinary skill in the art at the time of the invention (“POSITA”) would have had an undergraduate degree in computer science or a related field with at least two years of experience developing computer graphics software or an equivalent combination of experience and education. I met and exceeded these qualifications at the time of the invention and had substantial experience managing and interacting with such individuals.

V. Analysis and Opinions

a. Specification

17. Apple relies upon Dr. Wolfe for the conclusion that “a person of ordinary skill in the art would have understood [the] equivalence between ‘texturing’ in the claims and ‘texture mapping’ in the specification.” Dkt. 38 at 8. While, in general, “texturing” and “texture mapping”

can be (but need not be) understood to mean the same thing, I disagree with Dr. Wolfe's conclusion that "texturing" or "texture mapping" can *only* be understood to apply to the process of placing images on a 3D surface in this patent or indeed in general.

18. First, I note that all of Dr. Wolfe's citations to the '048 Patent (in Figures 3 and 10, and columns 18, 22, and 23) refer to exemplary approaches or particular embodiments of the invention. Simply because the patent provides certain examples in the specification of texture mapping being applied to 3D objects does not mean that patent teaches only mapping to 3D objects.

19. Second, the patent itself does not support Dr. Wolfe's conclusion. That is because Dr. Wolfe fails to note the distinction between texturing (or texture mapping) and display. This is evident from the use of the word "composite," which the patent recites in almost all instances directly before "texture mapping." *See* '048 Patent at 6:9; 22:35; 23:18; 23:59. "Composite texture mapping" involves mapping a texture onto a surface and then projecting, or displaying, that surface onto the screen for rendering. That is, the process described in the patent is a composite of two mapping operations that result in a map between a 2D image (the texture) and the 2D screen. In computer graphics, a person of ordinary skill in the art would understand that the creation of the model is often separate from the display of that model.

20. Texturing, by itself, refers to mapping—*i.e.*, the process of applying an image to a model no matter if the model is in 2D, 3D, or even higher dimensional space. Display, in contrast is the process of rendering the object to the screen. They are two separate operations—but Dr. Wolfe improperly combines both steps into the claim construction proposed by Apple. This is readily evident from the relevant claim language:

texturing the first image on the first object and the second image on the second object,

> the first object being ***displayed*** in a foreground of the 3D space and the second object being ***displayed*** in a background of the 3D space

21. The examples cited by Dr. Wolfe concern "composite texture mapping"—in other words, a step involving both texturing and display. It is logical that the specification would refer to 3D objects when it recites "composite texture mapping," but that does not mean that the patent teaches that texturing must be applied only to 3D objects. Textures are often mapped to 2D objects but displayed in 3D in computer graphics. Nor, as I explain more below, does Dr. Wolfe's analysis comport with extrinsic evidence or my own expertise. In sum, the patent does not teach that texturing or texture mapping can be applied only to 3D object and there is no justification to import such a limitation when the claim language itself demonstrates that such a limitation is not intended.

b. Extrinsic Evidence

22. My own expertise, supported by the works of others skilled in this field, support my conclusion that SpaceTime's construction—that texturing is not limited to 3D objects—is correct and Apple's proposed construction is an attempt to improperly limit the scope of the claims.

23. The only intrinsic evidence that Dr. Wolfe relies upon is a definition of "texture mapping" from a 2002 edition of the Microsoft Computer Dictionary. This single reference fails to support Dr. Wolfe's position. Dr. Wolfe asserts that because the reference states that the texture mapping process involves wrapping a texture around an object, that means that the object must be 3D. But the definition itself merely notes that the picture or pattern "can be" wrapped around, not that it must be. A picture or pattern could just as easily be applied to a flat or 2D surface to apply a texture to that surface. A skilled artisan, like myself, would also understand that process to be texturing or texture mapping.

24. Dr. Wolfe is also incorrect that the references that SpaceTime disclosed fail to rebut Apple's proposed construction.

25. First, "Texture Mapping as a Fundamental Drawing Primitive" ("Haeberli") does support the notion that texturing or texture mapping is not limited to 3D objects. Nor is the "unstated assumption" of the article that it is referring to the rendering of 3D objects. Haeberli indisputably notes that texture mapping can be applied to more than 3D objects.

26. The example applications given in Haeberli of image warping in Section 3.2 is a map from a 2D image to a 2D warped image. That section goes on to suggest an application of texture mapping to image panning (zooming in and translating the view across a large image) using texture mapping.

> image)[OTOK87]. The warp may be affine (to generate rotations, translations, shearings, and zooms) or higher-order. The points of the warped mesh are assigned the corresponding texture coordinates of the uniform mesh, and the mesh is texture mapped with the original image. This technique allows for easily-controlled interactive image warping. The technique can also be used for panning across a large texture image by using a mesh that indexes only a portion of the entire image.

(*Id.*)

27. In another example of drawing anti-aliased lines, Haeberli again gives an example of applying textures to 2D objects. Points and lines are drawn as 2D objects on the screen of a fixed screen width. Haeberli shows how to use texture mapping to create smoothly drawn lines by mapping textures onto 2D polygons where the width of the line is controlled by the width of the 2D polygon.

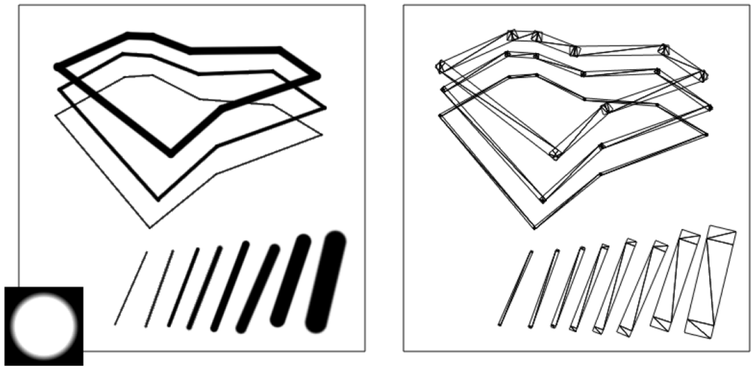


Figure 1. Anti-aliased line segments.

(*Id.* at 3)

28. In yet another example in Haeberli, the authors demonstrate how to create different brush strokes for drawing on an image using texture mapping to 2D polygons. This effect allows the user to paint different textures on the screen as different types of brush strokes for artist effect.

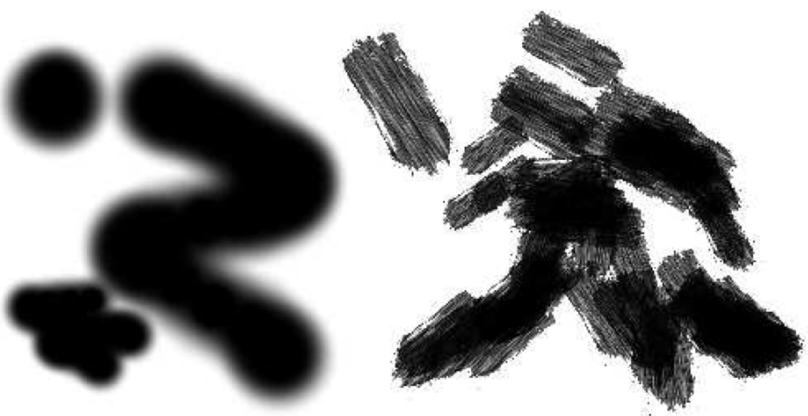


Figure 2. Painting with texture maps.

(*Id.* at 4)

29. Second, "As-Rigid-As-Possible Shape Manipulation" ("Igarashi"), published in July 2005 in ACM Transactions on Graphics, does refer to texture mapping, which under Dr. Wolfe's own declaration, means the same as texturing. Igarashi states "When manipulating a bitmap image, we simply use standard linear ***texture mappin***g." Ex. 2 at 3. Igarashi's paper is about computing deformations of a 2D image to another 2D image by triangulating the shape and using texture mapping to apply the image to a deformed 2D shape.

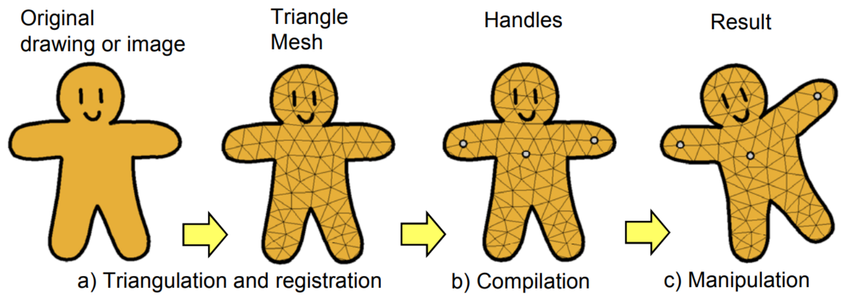


Figure 2: Overview of the system. The system first triangulates the original shape, and performs some pre-computation. The user adds handles. Moving the handles results in a fast deformation. (*Id.* at 2)

30. Igarashi explicitly states that they create the deformed image by using texture mapping onto these 2D triangles. Doing so allows the user to manipulate real-world images as shown below, and demonstrates that Igarashi supports that texture mapping or texturing can be applied to more than just 3D objects.

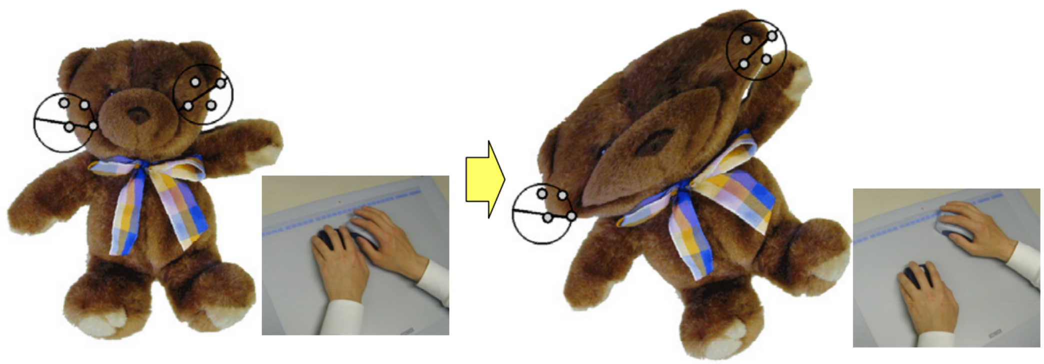
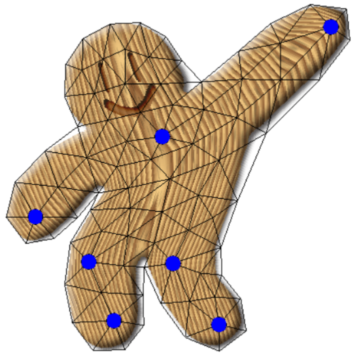


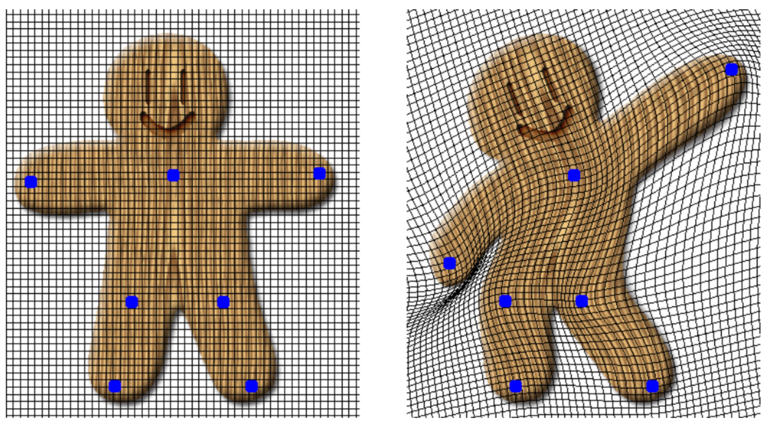
Figure 16: Manipulation of an image using two rotation sensitive mice. (*Id.* at 7)

31. Third, "Image Deformation Using Moving Least Square" ("Schaefer"), published in July 2006 in ACM Transactions on Graphics, which I am one of the authors of, also supports the understanding that texture mapping or texturing can be applied to 2D objects. *See* Ex. 3. The paper demonstrates the use of texturing to map 2D images onto a 2D space to perform image deformation. Figure 2 shows an image from Figure 1 that uses texturing to map portions of the image to a deformed state using Igarashi's method where each triangle is a texture mapped image.



(*Id.* at 2)

32. Figure 7 shows a similar image demonstrating how the deformations were built using texturing to map a 2D image onto a 2D space. Each image in the tiny squares on the left is textured (mapped) onto the corresponding square on the right to create a deformed image.



(*Id.* at 6)

33. I developed the ideas, wrote the paper, and built the implementation for that method in late 2005. I can assert that my implementation used texturing of 2D images onto 2D shapes without any 3D geometry.

VI. Conclusion

34. The intrinsic evidence, my own expertise, and the extrinsic evidence all support my conclusion that texturing, as used in the ’048 Patent, means drawing or mapping onto more than just 3D objects. Apple’s proposed construction improperly seeks to impose an additional limitation on the claim terms that is not supported by the evidence while SpaceTime’s construction correctly defines the scope of the claims.

I declare under penalty of perjury that to the best of my knowledge the foregoing is true and correct.

Date: 9/22/22

Dr. Scott Schaefer